Remarks

In view of the above amendments and the following remarks, reconsideration of the rejections and further examination are requested.

Claims 1-11 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Specifically, the rejection indicates that the use of the terms "a first given value", "a second given value", "a third given value" and "a given value" are not properly defined.

Claims 1 and 3 have been amended so as to remove the terms "a first given value" and "a second given value." As a result, the rejection is no longer applicable to claims 1-5. Regarding claims 6-11, the rejection is respectfully traversed for the following reasons.

Under 35 U.S.C. §112, second paragraph, there are two requirements that must be met: (1) the claims must set forth the subject matter that the Applicants regard as their invention; and (2) the claims must particularly point out and distinctly define the metes and bounds of the subject matter that will be protected by the patent grant. It appears from the rejection that the Examiner believes that claims 6, 8 and 9 fail to meet the second requirement due to the use of the terms "a first given value", "a second given value", "a third given value" and "a given value."

As indicated by M.P.E.P. §2173, the main purpose of this second requirement is to ensure that the scope of the claim is clear so that the public is informed of the boundaries of what causes infringement of the patent. A second purpose is to provide a clear measure of what the Applicants regard as their invention. It is submitted that claims 6, 8 and 9 satisfy the second requirement of 35 U.S.C. §112, second paragraph, as currently drafted.

The use of the terms "a first given value", "a second given value", "a third given value" and "a given value" in these claims clearly indicates that the respective variables (e.g., numerical number, numerical aperture, or power) to which these terms are associated have a "value." There is no question as to what is taking place in the phrases in which these terms are used and the boundaries of what is claimed are clearly defined.

As indicated in M.P.E.P. §2173.04, which cites In re Miller, 441 F.2d 689, 169 USPQ 597 (CCPA 1971), "[b]readth of a claim is not to be equated with indefiniteness." Therefore, although these "value" terms are broad, they surely are not indefinite. Further, this section of the M.P.E.P. continues, stating "[i]f the scope of the subject matter embraced by the claims is clear ... then the claims comply with 35 U.S.C. 112, second paragraph." Based on the above-

discussion, it is apparent that the scope of the subject matter is clear. As a result, withdrawal of the rejection under 35 U.S.C. §112, second paragraph, is respectfully requested.

Claims 1-5 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Forrest (US 4,709,413) in view of Marcuse (US 5,699,464) and Kaneko (US 4,815,807).

Claims 1 and 3 have been amended so as to further distinguish the present invention from the references relied upon in the rejection. As a result, it is submitted that the rejection is no longer applicable to these claims for the following reasons.

Claim 1 is patentable over the combination of Forrest, Marcuse and Kaneko, since claim 1 recites an optical transmission system having, in part, a transmitter for transmitting an optical signal toward a multi-mode fiber having an input plane with a core diameter, the transmitter including at least one lens having an optical axis and a vertex for converging an optical signal, wherein the vertex is located at a predetermined distance from the input plane of the multi-mode fiber, the predetermined distance is greater or less than a distance from the vertex to a focal point of the at least one lens, an incident light propagation cross-section of the optical signal is defined in a plane perpendicular to the optical axis at the predetermined distance from the vertex, and a distance between the focal point and the input plane is such that the incident light propagation cross-section is greater than a core cross-section defined by the core diameter at the input plane. The combination of Forrest, Marcuse and Kaneko fails to disclose or suggest these features of claim 1.

Forrest discloses a single-wavelength, bi-directional, fiber-optic system having a pair of terminals 10 and 12 linked by a transmission fiber 14. Each of the terminals 10 and 12 is a transceiver which is capable of generating and receiving radiation at the same wavelength. Each of the terminals 10 and 12 includes a photodiode 22 having an active region 26 for receiving radiation, a light source 16 for transmitting radiation, a lens (coupling means) 30 for coupling the radiation from the light source 16, through a hole 32 in the photodiode 22, into the fiber 14. (See column 3, line 11 - column 4, line 49 and Figures 1 and 2).

Based on the above discussion and the illustration of Figure 2, it is apparent that the lens 30 is positioned with respect to the fiber 14 such that the focal point of the lens 30 does not correspond with an input plane of the fiber 14. However, as illustrated in Figure 2, Forrest fails to disclose or suggest that a distance between the focal point of the lens 30 and the input plane of the fiber 14 is such that an incident light propagation cross-section of the radiation in a plane

perpendicular to the optical axis of the lens 30 at a predetermined distance from the vertex of the lens 30 is greater than a core cross-section defined by a core diameter at the input plane of the fiber 14. Therefore, Forrest fails to disclose or suggest these features of claim 1. As a result, it is necessary for Marcuse and/or Kaneko to disclose or suggest these features in order for the combination of Forrest, Marcuse and Kaneko to render claim 1 obvious.

Regarding Marcuse, it discloses a system having a multimode fiber 60 terminated by fusion splicing a length of homogeneous glass 61 onto the end of the fiber 60. A lens 62 is attached to the end of the glass 61 opposite to the fiber 60. The insertion of the glass 61 between the fiber 60 and the lens 62 moves the end of the fiber 60 away from the lens 62, which allows the lens to form a real image. Further, the glass 61 acts to capture almost all of the optical energy emitted by the fiber 60 and focus the energy at a point. (See column 3, line 2 – column 4, line 31 and Figure 6).

While Marcuse discloses the use of the glass 61 as a spacer between the fiber 60 and the lens 62, it is apparent that there is no disclosure or suggestion of a distance between the focal point of the lens 62 and an input plane of the fiber 60 is such that an incident light propagation cross-section of the optical energy in a plane perpendicular to the optical axis of the lens 62 at a predetermined distance from the vertex of the lens 62 is greater than a core cross-section defined by a core diameter at the input plane of the fiber 60. As a result, Marcuse also fails to disclose or suggest this feature of claim 1.

Regarding Kaneko, it discloses a system whereby two optical fiber elements coupled with collimator lenses are spaced apart from each other by a distance l. One of the optical fiber elements is connected to a laser source and the other optical fiber element is connected to an optical power meter. Depending on the types of collimator lenses used and the distance l, various power levels of the light from the laser source are received at the optical power meter. (See column 5, lines 36-47 and Figures 7 and 8(a)-8(g)).

Based on the above discussion, it is apparent that Kaneko demonstrates that the distance l between the two collimator lenses has an effect on the power level of the light received at the optical power meter. However, Kaneko fails to provide any detail regarding the relationship between the collimator lenses and the optical fiber elements. Therefore, Kaneko also fails to disclose or suggest that a distance between a focal point of a lens and an input plane of a fiber is such that an incident light propagation cross-section of a signal defined in a plane perpendicular

to an optical axis of the lens at a predetermined distance from a vertex of the lens is greater than a core cross-section defined by a core diameter at the input plane of the fiber, as recited in claim 1. As a result, it is apparent that the combination of Forrest, Marcuse and Kaneko fails to render claim 1 obvious.

As for claim 3, it is patentable over the combination of Forrest, Marcuse and Kaneko for reasons similar to those discussed above in support of claim 1. That is, claim 3 recites, in part, a distance between a focal point of a lens and an input plane of a fiber is such that an incident light propagation cross-section of an optical signal defined in a plane perpendicular to an optical axis of the lens at a predetermined distance from a vertex of the lens is greater than a core cross-section defined by a core diameter at the input plane of the fiber, which features are not disclosed or suggested by the references.

Because of the above-mentioned distinctions, it is believed clear that claims 1-11 are patentable over the references relied upon in the rejection. Furthermore, it is submitted that the distinctions are such that a person having ordinary skill in the art at the time of invention would not have been motivated to make any combination of the references of record in such a manner as to result in, or otherwise render obvious, the present invention as recited in claims 1-11. Therefore, it is submitted that claims 1-11 are clearly allowable over the prior art of record.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance. The Examiner is invited to contact the undersigned by telephone if it is felt that there are issues remaining which must be resolved before allowance of the application.

Respectfully submitted,

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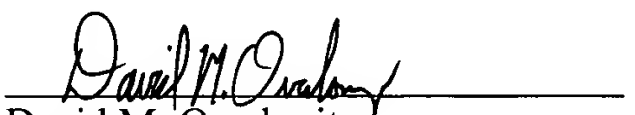
By: 

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